

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (CURRENTLY AMENDED) A method for reducing emission and fuel consumption in order to improve combustion in internal combustion engines, comprising the steps of:
preparing a mixture of fuel and air;
forwarding said mixture into a combustion chamber of the internal combustion engine;
guiding, in order to achieve perfect combustion, said mixture through a chamber acting as a treatment area having specific physical properties prior to its entry into the combustion chamber;
applying, within said treatment area, high voltage via one or more electrodes to the air stream to provide a charge of first polarity of the air stream;
applying high voltage via one or more electrodes to the fuel stream to provide a charge of opposite polarity of the fuel stream;
generating an ultrasonic vibration in the air stream by mechanically vibrating said one or more electrodes with a frequency in the ultrasonic range, thereby focussing and compressing the already charged air stream into a central zone of said chamber giving way, simultaneously, to the incoming, as yet non-charged, air stream, ensuring thereby the creation of ion concentration in higher quantity; and
generating an ultrasonic vibration in the fuel stream by mechanically vibrating said one or more electrodes with a frequency in the ultrasonic range, thereby releasing the fuel stream

already charged from the one or more electrodes towards an outlet of said chamber, and mixing more efficiently by the resonance and transferring electric charge to the as yet uncharged fuel stream and making way to a new fuel stream supplied to the chamber.

~~whereas, in order to achieve perfect combustion, prior to its entry into the combustion chamber of the internal combustion engine, the mixture of fuel and air is led through a treatment area characterized by specific physical properties, so as to provide, by applying high voltage, the air stream a charge of first polarity and the fuel stream a charge of opposite polarity, characterized by vibrating at least one of the air and the fuel stream by a frequency in the ultrasonic range.~~

2. CANCELLED

3. CANCELLED

4. (CURRENTLY AMENDED) A method according to claim 1,

~~characterized in that wherein the at least one of the air stream and the fuel stream is vibrated in several successive and/or parallel sections.~~

5. CANCELLED

6. CANCELLED

7. CANCELLED

8. (CURRENTLY AMENDED) A method according to claim 1,

~~characterized in that for the purpose of vibration frequencies in wherein the air stream and the~~

fuel stream is vibrated with a frequency within the range of 20 to 100 kHz, more preferably in the range of 35 to 45 kHz, will be used.

9. (CURRENTLY AMENDED) An equipment reducing emission and fuel consumption in order to enhance combustion in the internal combustion engine ~~whereas the said equipment contains a first ionizing unit providing the air stream with a charge of first polarity and a second ionizing unit providing the fuel stream with a charge of opposite polarity, characterized by including at least one ionizing unit which is equipped with means vibrating at least one of the air stream and the fuel stream by a frequency in the ultrasonic range, the equipment comprising:~~

a first ionizing unit providing the air stream with a charge of first polarity, said first ionizing unit comprises an ionizing chamber inserted in the path of the air stream transported to a combustion chamber of the internal combustion engine and one or more high-voltage electrodes providing the air stream with a charge of first polarity;

a second ionizing unit providing the fuel stream with a charge of opposite polarity, said second ionizing unit comprises an ionizing chamber inserted in the path of the fuel stream transported to a combustion chamber of the internal combustion engine and one or more high-voltage electrodes providing the fuel stream with a charge of opposite polarity;

a first vibrating means being attached to said ionizing chamber of said first ionizing unit, mechanically vibrating said one or more electrodes within said chamber with a frequency in the ultrasonic range, thereby focussing and compressing the already charged air stream into a central zone of said chamber giving way, simultaneously, to the incoming, as yet non-charged, air stream, ensuring thereby the creation of ion concentration in higher quantity; and

a second vibrating means being attached to said ionizing chamber of said second ionizing unit, mechanically vibrating said one or more electrodes within said chamber with a frequency in the ultrasonic range, thereby releasing the fuel stream already charged from one or more electrodes towards an outlet of said chamber, and mixing more efficiently by the resonance and transferring electric charge to the as yet uncharged fuel stream and making way to a new fuel stream supplied to the chamber.

10. CANCELLED

11. (CURRENTLY AMENDED) An equipment according to claim 9, wherein said characterized in that the vibrating means are a piezo-electric transducer connected to an ultrasound generator.

12. (CURRENTLY AMENDED) An equipment according to claim 9 comprising, characterized in that it includes several cascaded vibrating means being cascaded and/or connected in parallel.

13. CANCELLED

14. (CURRENTLY AMENDED) An equipment according to claim 9, comprising characterized in that the vibrating means is designed as a vibrating means with variable frequency, and/or it is designed as a vibrating means with variable signal amplitude.